Mora Obstruent Epenthesis in Loanword Adaptation

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Japanese has two major phonological adaptation strategies for loanwords: phonic substitution and epenthesis.[1] Phonic substitution refers to the strategy in which a speaker attempts to replace a sound in a donor language with one in her native language: see Paul (1880) or Bloomfield (1933: 445ff) for early work. The second major adaptation strategy, epenthesis, is the insertion of additional phonemes by the borrowing language. In the case of Japanese this can be further subdivided into vowel epenthesis and epenthesis of the mora obstruent /Q/. In this paper, I deal exclusively with mora obstruent epenthesis.

When the mora obstruent /Q/ occurs in canonical /V_C/ position, the /QC/ component is essentially a long, or geminate, consonant exhibiting 'suspension of articulatory movement' (Komatsu 1980: 566) or 'prolongation of consonantal articulation' (Shibatani 1990: 167-168). This 'suspension' or 'prolongation' of the succeeding obstruent creates an extra mora. In traditional Japanese linguistics the mora obstruent /Q/ is known as *sokuon* 促音.

The motivation behind /Q/-epenthesis is complex. As the donor language is of particular importance, I will restrict initial discussion to English *gairaigo* and treat borrowings from other languages thereafter. What follows below is intended as an overview of a phenomenon still the object of much ongoing research. Much of the analysis which follows owes a debt to previous work by Ohye (1967), Ohso (1971), Lovins (1973), Quackenbush (1977, 1989), Aoki (1981), Watanabe & Hirato (1985), Koo & Homma (1989), Kokken (1990), Hirata (1990), Ono (1991), Hirozane (1992), Takagi & Mann (1994), Kanai (1995), Kawagoe (1995), Ura (1995), Kitahara (1997), Katayama (1998: 69-149), Yamane & Tanaka (2000), Yamane (2001), Maruta (2001), Kawagoe & Arai (2002), Preston & Yamagata (2004), Rice (2006), Kubozono (2007), Kawahara (2008) and Hirayama (2008).

Epenthesis of the mora obstruent /Q/ occurs in three major environments, WORD-FINAL, STRESSED MEDIAL and SYLLABIC *L*, and in one minor environment, WORD-FINAL CLUSTER. In none of these environments is /Q/ generated exceptionlessly and, as in earlier sections, what I describe here is the dominant synchronic patterning. In many cases, previous descriptions of these environments have defined the consonants before which /Q/-epenthesis occurs as 'obstruents' (plosives, fricatives and affricates). This is erroneous.

[1] There is, in addition, a third minor strategy of adaptation, deletion, confined almost entirely to auditory loans.

Although never occurring before sonorants, the patterning we find is too refined for such a broad term as obstruent. In order to make subsequent analysis clearer, Table 1 summarizes the presence or absence of /Q/-epenthesis in each of the three major environments, listed in the leftmost column, before each of the English obstruents, listed in the shaded rows. A tick ✓ indicates that /Q/ is inserted with overwhelming frequency, a cross ✕ that /Q/-epenthesis rarely if ever occurs, and a boxed tick ☑ or cross ☒ indicates a strong tendency towards or away from /Q/-epenthesis. An empty box ☐ indicates an approximately even split, while a blank cell indicates that no examples exist. English donor |ts dz| are perceived as affricates by Japanese speakers and are included in my analysis. One English obstruent, the voiceless glottal fricative |h|, does not occur in any of the relevant environments and so is not treated further.

	p	**t**	**k**	**f**	**θ**	**s**	**ʃ**	**ts**	**tʃ**
WORD-FINAL	✓	✓	✓	☒	✕	✕	✓	✓	✓
STRESSED MEDIAL	☑	☑	☑	☒	☑	☑	☑	✓	☑
SYLLABIC *L*	✓	☒	✓	✓		✓	☒		✓
	b	**d**	**g**	**v**	**ð**	**z**	**ʒ**	**dz**	**dʒ**
WORD-FINAL	☒	☑	☑	✕		✕		✓	✓
STRESSED MEDIAL	✕	☒	☒	✕	✕	✕	✕	✕	☒
SYLLABIC *L*	✕	✕	☐	✕	✕	✕			✕

Table 1: /Q/-epenthesis in loanwords from English across three major environments

Across all environments, /Q/-epenthesis occurs only after a checked vowel, never after a free vowel, a rhotic vowel, or a diphthong. Checked vowels in English are 'subject to the phonotactic constraint that they do not occur in a stressed monosyllable with no final consonant' (Wells 1982: 119) and are almost identical to, and sometimes also termed, the lax vowels. They are | ɪ æ ʌ ʊ| and what is |e| in Received Pronunciation (RP) and |ɛ| in General American (GA). A sixth vowel |ɒ|, checked in RP, corresponds to GA |ɑ|, where it is free. Like the substitution of rhotic vowels, it is RP articulations on which /Q/-epenthesis is based and thus it may be triggered after |ɒ ~ ɑ|.

Moreover, /Q/-epenthesis occurs only when a checked vowel is substituted by a short vowel in Japanese, a substitution which occurs with overwhelming frequency. The Japanese syllable in which /Q/-epenthesis occurs is thus a heavy one, (C)(G)VQ. There are, however, both dictionary loans (e.g. *imeeji* ← *image*, etc.) and spelling loans (e.g. *derikeeto* ← *delicate*, etc.) where a checked vowel is substituted by a long vowel. Here, /Q/-epenthesis never occurs and forms containing a superheavy syllable, (C)(G)VVQ, such as

**imeeQji* or **derikeeQto*, are never found. This is in line with the claim that superheavy syllables are typically eschewed in Japanese (Kubozono 1989, 1995, 1999).

The first major environment in which epenthesis of the mora obstruent /Q/ typically occurs in borrowings from English, the WORD-FINAL environment, is where a donor word ends in a plosive or affricate preceded by a checked vowel. In other words, donor words containing the string:

(1) |VC#|, where |V| = checked monophthong, |C| = plosive or affricate, # = word boundary

Such a string typically → /V_1QCV_2/, where /V_2/ is an epenthetic vowel. This is illustrated in (2-3).

(2)	|Vp#|	*tip*	či**Q**pu	‘tip, gratuity’
	|Vt#|	*diet*	daie**Q**to	‘diet’
	|Vk#|	*click*	kuri**Q**ku	‘(mouse) click’
	|Vts#|	*guts*	ga**Q**cu	‘guts, courage’
	|Vʧ#|	*sketch*	suke**Q**či	‘sketch’
(3)	|Vd#|	*thoroughbred*	sarabure**Q**do	‘thoroughbred’
	|Vg#|	*smog*	sumo**Q**gu	‘smog’
	|Vdz#|	*odds*	o**Q**zu	‘odds’
	|Vʤ#|	*judge*	ja**Q**ji	‘judge’

English donor words with WORD-FINAL |b| are an exception to the pattern in (1). Here, /Q/ is rarely triggered. Some of the very few examples where it is include *moQbu* ‘mob’, *sunoQbu* ‘snob’ and *sukyaQbu* ‘scab (worker)’. For donor words in final |d|, /Q/ is generated with only some exceptions. While /Q/ is also typically triggered for donor words in final |g|, there are a number of examples where it is not, including *burogu* ‘blog’ (although buroQgu is occasionally found), *gyagu* ‘(comedy) gag’ and *anarogu* ‘analogue’. The reason for this *d* > *g* > *b* ranking among the voiced plosives, where donor words with

final |d| are the most likely, and those with final |b| the least likely, to trigger /Q/-epenthesis is unclear. Koo & Homma (1989: 130) believe it may be due to the closure duration of /b/ being longer than that of /d/ or /g/, and the vowel preceding /b/ thus being shorter. Katayama (1998: 127-128) speculates on a link with intervocalic spirantization of the voiced plosives: only /d/ 'does not weaken'.[2] The possibility also exists that we are dealing with dictionary traditions.[3]

In a conservative pronunciation, donor |C| in (1) may be devoiced during adaptation, so that the examples in (3) become *sarabure**Qto**, sumo**Qku**,* etc. In a survey of 40 informants, Quackenbush (1989: 5-7) found that the youngest (all aged 12) and oldest (aged 35-45) age cohorts were most likely to devoice the final consonant and pronounce words such as *beQdo* 'bed' and *burudoQgu* 'bulldog' as *beQto* and *burudoQku*. Although she did not survey donor word-final |b| and her oldest age cohort is comparatively young, the curve elicited by her results closely mirrors that proposed by Downes (1984: 191) to describe the relationship between vernacular usage and age. In other words, contemporary forms such as *beQdo*, used more frequently by Quackenbush's 20-25 year-old age cohort, appear to be more prestigious than the vernacular conservative forms such as *beQto* used by the youngest and oldest age cohorts.[4]

When a donor English word ends in a fricative in WORD-FINAL environment, the mora obstruent /Q/ is, for the most part, not generated. This is illustrated in (4). With donor |f| there is at least one common counterexample with epenthetic /Q/: *sutaQfu* '(member of) staff' ← *staff*. Donor |ʃ| is the exception. Here, /Q/ is regularly found, as shown in (5).

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[2] Historically, the equivalent voiceless ranking t > k > p is found when describing the extent (least to most common) of word-internal allophonic voicing among the Old Japanese plosive tenues (Unger 2004).

[3] Dictionary traditions vary according to donor language, though all have in common the fact that their adaptation rules were established and standardized by Japanese scholars of foreign languages, then perpetuated through their pedagogical practices and foreign language textbooks. Since its spelling is notoriously opaque, donor words from English are typically assigned a dictionary pronunciation at a point prior to adaptation. French spelling too is opaque and a dictionary pronunciation is typically assigned here also. For major donor languages whose spelling is more transparent, such as German, Russian or Italian, the assignment of a dictionary pronunciation is less important. A borrowing whose source is orthographic, which has been assigned a dictionary pronunciation, and which has undergone adaptation based on a dictionary tradition is a dictionary loan. Dictionary traditions are, in effect, prescribed adaptation strategies. Since, however, each donor language has its own prescription, the same source sound may follow more than one adaptation pathway.

[4] Quackenbush (opus cit.) also found that overall devoicing occurred more commonly in conversation-style than in word-list or reading-style elicitations.

(4)	|Vf#|	*off*	ofu	'off'
	|Vv#|	*love*	rabu	'love'
	|Vθ#|	*Smith*	sumisu	'Smith'
	|Vs#|	*bus*	basu	'bus'
	|Vz#|	*jazz*	jazu	'jazz'
(5)	|Vʃ#|	*cash*	kyaQšu	'cash'
	|Vʃ#|	*stylish*	sutairiQšu	'stylish'

To the author's knowledge, the only attempt to statistically quantify the level of /Q/-epenthesis in WORD-FINAL environment has been that of Maruta (2001: 73-75), who used the *gairaigo* dictionary SSDH (1991) for his database (n = 972), but excluded proper nouns, mora-clipped forms and compound-clipped forms. Since his analysis is not carried out by donor |C| but by substituted /C/, I have converted and in some cases amalgamated his figures.[5] These are summarized in Table 2.

English word-final donor phone	tʃ	ʒ / dʒ	p	t	k	ʃ	d	g	z/ð /dz	ts	b	f	s/θ	v
% /Q/-epenthesis	100	100	99	99	98	91	71	56	50	33	23	13	1	0

Table 2: Percentage of /Q/-epenthesis by English donor obstruent in WORD-FINAL environment (after Maruta 2001)

Maruta's analysis confirms the ranking *d* > *g* > *b* amongst the voiced plosives. The unexpectedly low incidence of 33% shown for donor |ts| is problematic. Maruta includes words such as *šacu* 'shirt' in his analysis of substituted /c/, but this donor word actually has final |t| preceded by a rhotic vowel. If other such words were excised from Maruta's corpus, the figure for English donor |ts| would likely rise considerably. The incidence of 50% for donor word-final |z ～ ð ～ dz| is contributed to solely by |dz|. I know of no examples where /Q/ is triggered before donor English word-final |ð| or |z|.

[5] Thus, donor |s| and |θ| are amalgamated, since both → /s/ or /š/. Similarly, |ʒ| and |dʒ| both → /j/, while |z|, |ð| and |dz| all → /z/ or /j/.

The second major environment in which /Q/-epenthesis occurs is STRESSED MEDIAL. Here, epenthesis is triggered when an intervocalic voiceless obstruent is preceded by a stressed checked vowel. In other words, donor words containing the string:

(6) |V_1CV_2|, where |C| = voiceless obstruent, |V_1| = stressed checked monophthong, |V_2| = any vowel

Such a string typically → / V_1QCV_2/. This is illustrated below:

(7)	|V_1pV_2|	*háppy*	ha**Q**pi	'happy'
	|V_1tV_2|	*bátter*	ba**Q**taa	'batter'
	|V_1kV_2|	*sáccharin*	sa**Qk**ariN	'saccharin'
	|V_1tsV_2|	*sprítzer*	supuri**Qc**a	'spritzer'
	|$V_1tʃV_2$|	*pítcher*	pi**Qč**aa	'pitcher'
	|$V_1θV_2$|	*nóthing*	na**Qši**Ngu	'nothing'
	|V_1sV_2|	*méssage*	me**Qs**eeji	'message'
	|$V_1ʃV_2$|	*admíssion*	adomi**Qš**oN	'(university) admission'

Exceptions in STRESSED MEDIAL environment are far more prevalent than in WORD-FINAL and can easily be found for most of the voiceless obstruents listed in (7). Some are listed in (8). Lack of /Q/-epenthesis is especially apparent before |ʃ| in donor words ending with <tion>. Despite the number of exceptions, /Q/-epenthesis unquestionably occurs more often than not in STRESSED MEDIAL environment.

(8)	|V_1pV_2|	*cópy*	ko**p**ii	'(photo)copy'
	|V_1tV_2|	*bútter*	ba**t**aa	'butter'
	|V_1kV_2|	*líquor*	ri**k**aa	'liquor'
	|$V_1tʃV_2$|	*nátural*	na**č**uraru	'natural'
	|V_1sV_2|	*clássical*	kura**š**ikaru	'classical'
	|$V_1ʃV_2$|	*ambítion*	aNbi**š**oN	'ambition'

In STRESSED MEDIAL environment, /Q/ is generated only very rarely before |f| and typically not generated at all before voiced obstruents. Some examples where /Q/ is

generated are shown in (9). These are largely restricted to the co-occurrence of a following *-ing* or *-er* morpheme.

(9)	$\|V_1fV_2\|$	*búffer*	ba**Q**faa	'buffer (in computing)'
	$\|V_1dV_2\|$	*heá**d**ing*	he**Q**diNgu	'header (in football)'
	$\|V_1gV_2\|$	*slú**gg**er*	sura**Qg**aa	'slugger (in baseball)'
	$\|V_1dʒV_2\|$	*dré**dg**er*	dore**Qj**aa	'dredger'

Ohso (1971: 33, cited in Lovins 1973: 119-120) has pointed out that since the string /QCVQC/ is generally avoided in Japanese,[6] potential conflicts are resolved by an environment ranking whereby WORD-FINAL dominates STRESSED MEDIAL. This may be illustrated in the following examples:

(10)	*Góthic*	gošiQku	'Gothic (art, font)'
	kétchup	kečaQpu	'ketchup'
	tícket	čikeQto	'ticket'

Here, forms such as **goQšiku* or **goQšiQku*, with STRESSED MEDIAL /Q/-epenthesis, are not found. A few obsolete *gairaigo* are exceptions: e.g. *koro**QkeQto* 'croquette'.

I turn now to the last of the three main environments, SYLLABIC *L*. Although SYLLABIC *L* environment is similar to STRESSED MEDIAL, /Q/-epenthesis here is triggered before a more restricted number of voiceless obstruents, typically when |p k f s tʃ| are followed by word-final syllabic |l| and preceded by a stressed checked vowel. In other words, donor words containing the string:

(11) |VCl#|, where |C| = |p k f s tʃ|, |V| = stressed checked monophthong, # = word boundary

Such a string typically → /V_1QCV_2ru/, where /V_2/ is an epenthetic vowel. Examples are

[6] Exceptions are most common where this string straddles a morpheme boundary (e.g. no***QtoQta*** 'was in accordance with', hi***QpaQta*** 'tugged', pani***QkuQta*** 'panicked').

shown in (12), although those containing donor |tʃ| are few and far between.

(12)	|Vpl#|	*ápple*	a**Q**puru	'apple'
	|Vkl#|	*tácklе*	ta**Q**kuru	'tackle'
	|Vfl#|	*wáffle*	wa**Q**furu	'waffle'
	|Vsl#|	*whístle*	hoi**Q**suru	'whistle'
	|Vtʃl#|	*Mítchell*	mi**Qč**eru	'(David) Mitchell'

Cases of /Q/-epenthesis before donor |t| and |ʃ| in SYLLABIC *L* environment are scarce (13a, 14a), examples such as those in (13b, 14b) without any /Q/-epenthesis being the norm. Borrowings containing the English donor string |Vgl#| are rare and occur both with (15a) and without (15b) /Q/-epenthesis, as well as doublets in both (15c). /Q/-epenthesis in SYLLABIC L environment appears never to occur before other obstruents.

(13)	|Vtl#|	a. *thróttle*	suro**Q**toru	'throttle, gas'
			b. *shúttle*	šatoru	'shuttle'
(14)	|Vʃl#|	a. *búshel*	buQšeru	'bushel'
			b. *inítial*	inišaru	'initials'
(15)	|Vgl#|	a. *júggle*	ja**Q**guru	'juggle'
			b. *tóggle*	to**g**uru	'toggle'
			c. *strúggle*	sutoraQ**g**uru～sutora**g**uru	'struggle'

Although it is tempting to extend the SYLLABIC *L* environment to cover English word-final syllabic |n̩|, here /Q/-epenthesis is erratic, examples fewer, and variation in the epenthetic vowel found after donor |C| much in evidence:

(16)	|Vtn̩#|	*cótton*	ko**Q**toN	'cotton'
	|Vtn̩#|	*mítten*	mitoN	'mitten'
	|Vkn̩#|	*chícken*	či**k**iN	'chicken'
	|Vtʃn̩#|	*kítchen*	ki**Qč**iN	'kitchen'
	|Vsn̩#|	*lésson*	re**Q**suN	'lesson'

|Vfn̩#| *múffin*	mafiN	‘muffin’

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The minor environment which triggers epenthetic /Q/ is WORD-FINAL CLUSTER, where a donor word ends in a plosive-fricative cluster preceded by a checked vowel. In other words, donor words containing the string:

(17) $|VC_PC_F\#|$, where $|C_P|$ = plosive, $|C_F|$ = fricative, |V| = checked monophthong, # = word boundary

Such a string typically → $/V_1QCV_2CV_3/$, where $/V_2/$ and $/V_3/$ are both epenthetic vowels:

(18)	|Vks#|	*box*	bo**Q**kusu	‘box’
	|Vps#|	*J-pops*	jeepo**Q**pusu	‘Japanese pop music’
	|Vpθ#|	*depth (gauge)*	de**Q**pusu (geeji)	‘depth gauge’

The English plosive-fricative clusters |tʃ ts dʒ dz| are perceived as affricates and thus trigger /Q/-epenthesis according to WORD-FINAL environment (1). /Q/-epenthesis does not occur to any extent in WORD-FINAL CLUSTER environment when the consonant cluster is composed of two fricatives, two plosives or with the reverse order fricative-plosive.

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In cases where a loanword may be perceived as consisting of ‘two prosodically independent... morphemes’ between which ‘an interval... is inserted’ (Ura 1995: 180), then ‘#’ in (1) WORD-FINAL, (11) SYLLABIC *L* and (17) WORD-FINAL CLUSTER environments may be redefined as ‘morpheme boundary’. Here, a considerable amount of /Q/-epenthesis may be found:

(19)	WORD-FINAL	*hatchback*	ha**Q**čibaQku	‘ hatchback’
		upgrade	a**Q**pugureedo	‘upgrade’
	SYLLABIC L	*duffle coat*	da**Q**furukooto	‘duffle coat’

	*apple*mint	a**Q**purumiNt	'applemint'
WORD-FINAL CLUSTER	*tax-free*	ta**Q**kusufurii	'duty-free, tax-free'
	*Ox*bridge	o**Q**kusuburi**Q**ji	'Oxbridge'

	voiceless plosives	voiceless fricatives	voiceless affricates	voiced plosives	voiced fricatives	voiced affricates	all voiceless	all voiced	all phones
WORD-FINAL	✓	☒	✓	☐	×	✓	☐	☐	☐
STRESSED MEDIAL	☑	☐	✓	×	×	×	☑	×	☐
SYLLABIC *L*	☑	☑	✓	☒	×	×	☑	×	☐
ALL ENVIRONMENTS	☑	☐	✓	☒	×	☐	☑	☒	☐

Table 3: /Q/-epenthesis in loanwords from English: summary by environment and manner of articulation

Table 3 groups and averages the contents of Table 2 by manner of articulation (plosives, fricatives and affricates, both voiceless and voiced). The same symbols are employed. While the averages are not weighted in any way and thus take no account of the higher frequency of certain phones in certain environments, they do serve as a rough index on which may be based some general observations on /Q/-epenthesis in English *gairaigo*. These are:

(a) /Q/-epenthesis is most likely to occur in WORD-FINAL environment, where it is almost always triggered before affricates (voiceless ✓, voiced ✓) and voiceless plosives (✓). It has been argued that 'English word-final voiceless plosives after lax [checked] vowels have, to a Japanese ear, an auditory impression which is closer to geminate consonants than to single ones' (Takagi & Mann 1994: 345). Nevertheless, /Q/-epenthesis also occurs frequently in WORD-FINAL environment before voiced /d g/ (3, Table 2).

(b) Across all environments and articulations, /Q/-epenthesis occurs with appreciably greater frequency before voiceless phones (☑) than before voiced (☒). Across all environments it is triggered most commonly before voiceless affricate (✓) and voiceless plosive (☑) articulations. The only examples of significant /Q/-epenthesis before voiced phones are in WORD-FINAL environment before affricates (✓) and plosives (☐). Epenthesis never occurs before voiced fricatives (×).

(c) Voiced affricates display the most variation by environment, with /Q/-epenthesis occurring almost always (✓) in WORD-FINAL environment, but hardly ever (×) in

STRESSED MEDIAL and SYLLABIC *L* environments.

(d) Voiceless fricatives display the least internal consistency as an articulatory class. In SYLLABIC *L* environment, we find a strong tendency towards /Q/-epenthesis (☑). In STRESSED MEDIAL environment, /Q/-epenthesis is reasonably common before voiceless fricatives (☐), although not /f/. In WORD-FINAL environment, however, we find a strong tendency away from /Q/-epenthesis (☒), with /Q/ found to any degree only before |ʃ|. In this environment, Ohye (1967: 114-115) has claimed /Q/ is not generated with the other three English donor voiceless fricatives |s f θ| because they are 'attracted to the previous mora'.

For a discussion on a possible link — which I discount — between /Q/-epenthesis and double letters in English spelling (i.e. <tt> <pp>, etc.), see Arai & Kawagoe (1996, cited in Preston & Yamagata 2004) and Shirai (1999). In other environments, /Q/-epenthesis is extremely sporadic and awaits further research.

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Examples of /Q/-epenthesis in loanwords from languages other than English are fewer, the data meagre and syntheses problematic. I offer here a brief description of /Q/-epenthesis in loanwords from French, German, Dutch, Russian, Korean and Portuguese. There are no examples of the phenomenon in Chinese gairaigo. Although the term 'checked vowel' is generally applied only to English, redefining |V| in (1, 11, 17) and |V$_1$| in (6) as 'short' or 'lax' allows us to examine the four environments cross-linguistically.

Apart from the distinction between |ɛ| and |ɛ:| made by some speakers, vowel length in French is non-phonemic. One condition under which allophonic lengthening occurs is when |o ø ɑ| appear in closed stressed syllables (Tranel 1987: 49). In French, word-final syllables containing these vowels are always stressed. Thus, they are always long in WORD-FINAL environment and examples of /Q/-epenthesis in gairaigo where the donor vowel is |o ø ɑ| are consequently rarely found. Also rarely found are examples where the donor vowel is |u|. This vowel appears to resist /Q/-epenthesis and instead undergoes compensatory lengthening (Shinohara 1997: 81). Thus, *eNkuruuto* 'en croûte' ← Fr. *en croûte* and *guadoruupu* ← Fr. *Guadeloupe*. With other French donor vowels, WORD-FINAL /Q/-

epenthesis is possible and some examples are shown in (20). Nevertheless, compensatory vowel lengthening may be found with these vowels too (Arai 1993). Examples include *ankeeto* 'survey' ← Fr. *enquête* and *esukabeešu* 'escabèche' ← Fr. *escabèche*. As illustrated in (21), /Q/-epenthesis in WORD-FINAL environment generally does not occur before |s| and |f|. Nor does it occur before voiced obstruents. Here, again, we typically find compensatory vowel lengthening (Miyashita 1993), as illustrated in (22).

(20)	|ak#|	Fr. *Balza**c***	baruza**Q**ku	'(Honoré de) Balzac'
	|aʃ#|	Fr. *Caran d' A**ch**e*	karaNda**Q**šu	'Caran d'Ache'
	|ɛk#|	Fr. *Québe**c***	kebe**Q**ku	'Quebec'
	|ɛt#|	Fr. *bague**tt**e*	bage**Q**to	'baguette'
	|ik#|	Fr. *esthéti**q**ue*	esuteti**Q**ku	'beauty care, beauty salon'
	|ip#|	Fr. *Louis-Philip**p**e*	ruifiri**Q**pu	'(King) Louis-Philippe'
(21)	|is#|	Fr. *Matis**s**e*	mati**s**u	'(Henri) Matisse'
	|ɛs#|	Fr. *Me**tz***	me**s**u	'Metz'
	|af#|	Fr. *Pia**f***	pia**f**u	'(Edith) Piaf'
(22)	|ib#|	Fr. *Anti**b**es*	aNt**ii**bu	'Antibes'
	|ɛv#|	Fr. *Genè**v**e*	jun**ee**bu ~ jun**ee**vu	'Geneva'
	|aʒ#|	Fr. *reporta**g**e*	ruporut**aa**ju	'documentary'

Since stress in French typically falls on the final syllable, candidate *gairaigo* for STRESSED MEDIAL /Q/-epenthesis are scarce. However, stress falls on the penultimate syllable when a word ends in syllabic |ʁ| and here we do find loans with /Q/-epenthesis: e.g. *ri**Q**toru* 'litre' ← Fr. *litre* and its compounds. On the other hand, *mee**t**oru* 'metre' ← *mètre* and its compounds exhibit compensatory vowel lengthening instead. Yet other *gairaigo* have medial /Q/ despite syllable-final stress: e.g. *de**Q**saN* 'drawing, design' ← Fr. *dessin*, *e**Q**feru* 'Eiffel (Tower)' ← Fr. *(Tour) Eiffel*. Although Miyashita (1993: 218-219) believes examples like these are spelling loans[7] influenced by double letters, there exist

[7] Loans whose source is orthographic also include a not insignificant number of cases where a dictionary pronunciation has not been assigned (cf. fn 3). Here, when adaptation has been based on a spelling which is an inaccurate representation of pronunciation, the result is a spelling loan (*tsuzuriji hatsuon* 綴り字発音 in the Japanese tradition).

cases which are clearly not influenced by donor spelling. These include *ša**Q**po* 'hat' ← Fr. *cha**p**eau*; see the summary in Arai (1993: 80-85). French *gairaigo* appear not to undergo WORD-FINAL CLUSTER /Q/-epenthesis (23), while the lack of any examples means comment on SYLLABIC *L* /Q/-epenthesis is not possible.

(23)	|Vks#|	Fr. *Ai**x***	**ekusu**	'Aix'
	|Vks#|	Fr. *Astéri**x***	asuteri**kusu**	'Asterix'

Borrowings from German and Dutch show similar patterns of /Q/-epenthesis to English. Here, /Q/ is typically generated in both WORD-FINAL (24ab) and STRESSED MEDIAL (24cd) environments and, though examples are scarcer, in WORD-FINAL CLUSTER (24ef) and SYLLABIC *L* environments (24gh) also.

(24)	a. |Vx#|	Ger. *Ma**ch***	ma**Qh**a	'Mach (speed)'
	b. |Vk#|	Du. ***dek***	de**Qk**i	'deck'
	c. |V_1tV_2|	Ger. *Hü**tte*** 'hut, cabin'	hyu**Q**te	'mountain(eering) hut'
	d. |V_1tV_2|	Du. ***letter*** 'letter'	re**Qt**eru	'label'
	e. |Vps#|	Ger. *Schna**pps***	šuna**Qpusu**	'schnapps'
	f. |Vks#|	Ger. *Feli**x***	feri**Qkusu**	'Felix (Mendelssohn)'
	g. |Vkl#|	Du. ***nikkel***	ni**Qk**eru	'nickel'
	h. |Vsl#|	Du. ***Brussel***	buryu**Qs**eru	'Brussels'

With Russian loans, /Q/-epenthesis is rare. It is typically absent in both WORD-FINAL and STRESSED MEDIAL environments. When the final syllable is stressed, a similar phenomenon to that found in French may be witnessed in WORD-FINAL environment, that of compensatory vowel lengthening: e.g. *kura**aku*** 'kulak' ← Ru.кул**ак** |kul**ák**|. The only environment where /Q/-epenthesis may occur in Russian appears to be with the suffix -ович -|ov^{j}ič^{j}|, 'son of', and its variants (25a). Epenthesis may occur in personal names from other Slavic languages before this suffix, where it has various pronunciations, spellings and transliterations (25b). There are, however, many examples where epenthesis does not occur and many family names and patronymics have doublets with and without /Q/.

(25)	a. Ru. Ростропович	|rostropov^{j}i**č**^{j}|	rosutoropoovi**Q**či	'(Mstislav) Rostropovich'
	b. Serb. *Milošević* Милошеви***ћ***		mirošebi**Q**či	'(Slobodan) Milošević'

With loans from Korean, according to Sugawara (2006: 24-26) and from whom the examples below are taken, /Q/ is typically not triggered in WORD-FINAL environment when the final consonant is |p| or |k| (26ab), although there are sporadic cases where it is (26cd). It never occurs when the final consonant is |t|. Here, |t| → /Q/ (26e). Since Korean is not a stress-timed language, conditions for the STRESSED MEDIAL environment do not exist. Nevertheless, Sugawara (opus cit.: 26-28) reports that word-medial /Q/-epenthesis does occur albeit infrequently, especially before donor |kh| and |k*|.

(26)	a. |Vp#|	*Kor. pa**p***	밥	pa**p**u	'rice, meal'
	b. |Vk#|	*Kor. pa**k***	박	pa**k**u	'Park (Chung-hee)'
	c. |Vp#|	*Kor. ssampa**p***	쌈밥	saNpa**Qp**u	'wrapped rice'
	d. |Vk#|	*Kor. ttŏ**k***	떡	to**k**u ～ to**Qk**u	'sweet rice cake'
	e. |Vt#|	*Kor. tolsot'*	돌솥	toruso**Q**	'stone pot'

There are at least two examples where /Q/-epenthesis occurs in Iberian borrowings. All are from Portuguese, occur in STRESSED MEDIAL environment before donor |p|, and are the oldest examples of /Q/-epenthesis in the *gairaigo* stratum, attested in 1608 (Arakawa 1977) and 1655 (NKD 2000-02), respectively:

(27)	|V_1pV_2|	Por. *ca**p**a*	ka**Qp**a	'raincoat'
	|V_1pV_2|	Por. *co**p**o*	ko**Qp**u	'suit of cups'

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